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Chiba

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(54) **IMAGE PROCESSING APPARATUS DETECTING POSITION BETWEEN MOBILE DEVICE AND RECEPTION AREAS AND RECEIVING AN INSTRUCTION OF PROCESSES**

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G06K 15/00 (2006.01)
H04N 1/00 (2006.01)
H04N 1/32 (2006.01)

(52) **U.S. Cl.**
CPC ***H04N 1/32448*** (2013.01); ***H04N 1/32454*** (2013.01); ***H04N 1/32496*** (2013.01); ***H04N 1/00342*** (2013.01)

(58) **Field of Classification Search**
CPC . H04N 1/32; H04N 1/32122; H04N 1/32448; H04N 1/00392; H04N 1/00411; H04N 1/00474; H04N 1/00962; H04N 1/32454; H04N 1/32496; H04N 2201/0094; H04N 2201/3205; H04N 2201/3222; H04N 2201/3274; H04N 2201/3278
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

8,854,644	B2 *	10/2014	Chiba	358/1.13
2007/0033540	A1 *	2/2007	Bridges et al.	715/769
2008/0058012	A1 *	3/2008	Ookuma	455/557
2008/0180714	A1	7/2008	Ishikawa	
2009/0009780	A1 *	1/2009	Hayashi et al.	358/1.9
2010/0110032	A1	5/2010	Kim et al.	

FOREIGN PATENT DOCUMENTS

CN	101729808	A	6/2010
JP	2008-187495	A	8/2008
JP	2010-9121	A	1/2010

OTHER PUBLICATIONS

Machine translation of JP Pub 2010-009121 to Nakagawa Koichi.*

* cited by examiner

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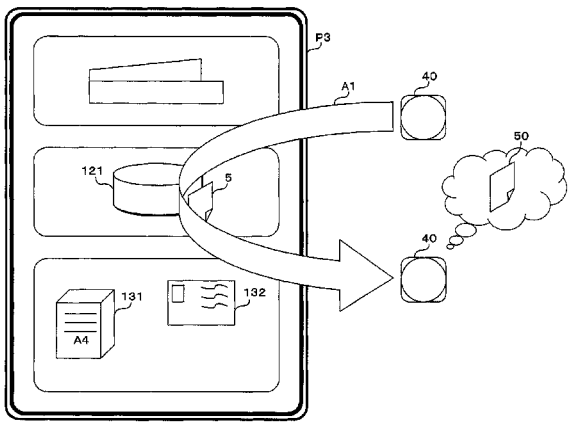
(57) **ABSTRACT**

A storage apparatus, which stores image data, comprises a storage-side transmitting/receiving section transmitting image data to an image processing apparatus and receiving image data from the image processing apparatus. The image processing apparatus, which carries out one or a plurality of processes related to image data, comprises a receiving section having reception areas each of which is provided fore each process for receiving an instruction of the processes; a specifying section detecting a relative position between the storage apparatus and the reception areas and specifying one reception area based on the variation of detected relative position; a processing-side transmitting/receiving section transmitting image data to the storage apparatus or receiving image data from the storage apparatus; and a processing section carrying out a process, corresponding to the reception area specified by the specifying section, on image data which the processing-side transmitting/receiving section transmits or receives.

6 Claims, 15 Drawing Sheets



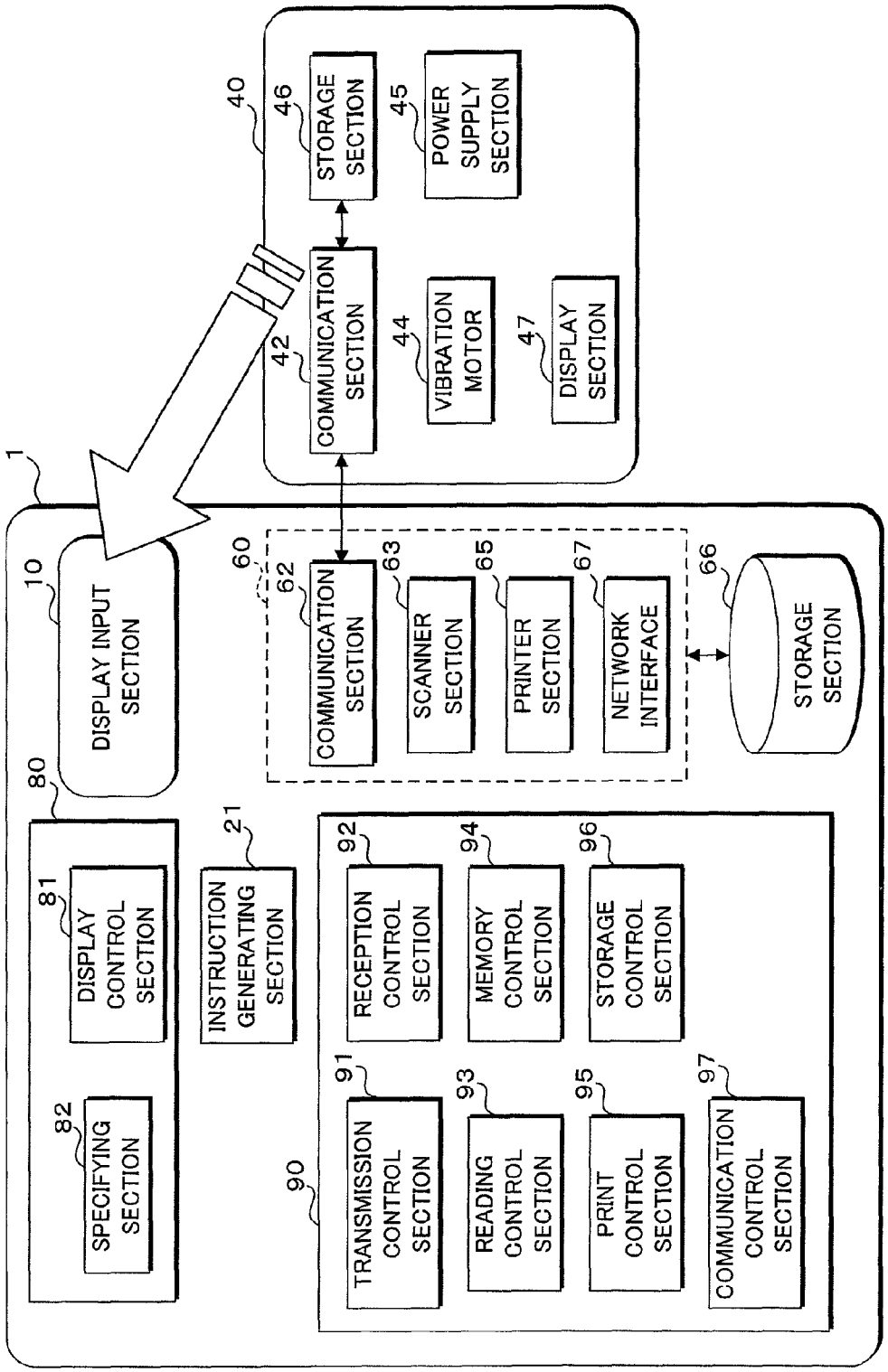

1
10
DISPLAY INPUT SECTION
80
81
DISPLAY CONTROL SECTION
82
SPECIFYING SECTION
21
INSTRUCTION GENERATING SECTION
90
91
TRANSMISSION CONTROL SECTION
92
RECEPTION CONTROL SECTION
93
READING CONTROL SECTION
94
MEMORY CONTROL SECTION
95
PRINT CONTROL SECTION
96
STORAGE CONTROL SECTION
97
COMMUNICATION CONTROL SECTION
60
62
COMMUNICATION SECTION
63
SCANNER SECTION
65
PRINTER SECTION
67
NETWORK INTERFACE
66
STORAGE SECTION
40
42
COMMUNICATION SECTION
44
VIBRATION MOTOR
45
POWER SUPPLY SECTION
46
STORAGE SECTION
47
DISPLAY SECTION

FIG. 1

FIG. 2

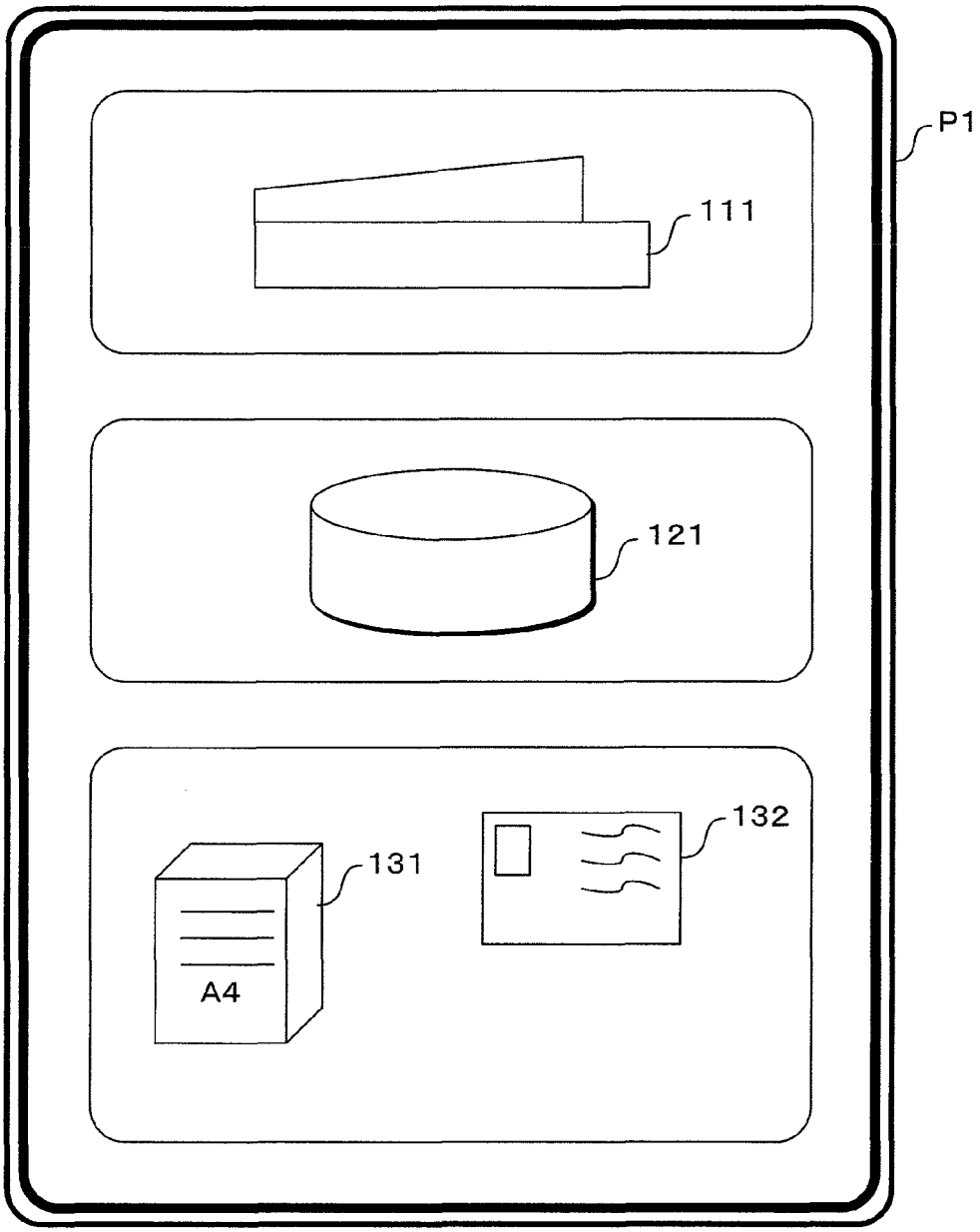
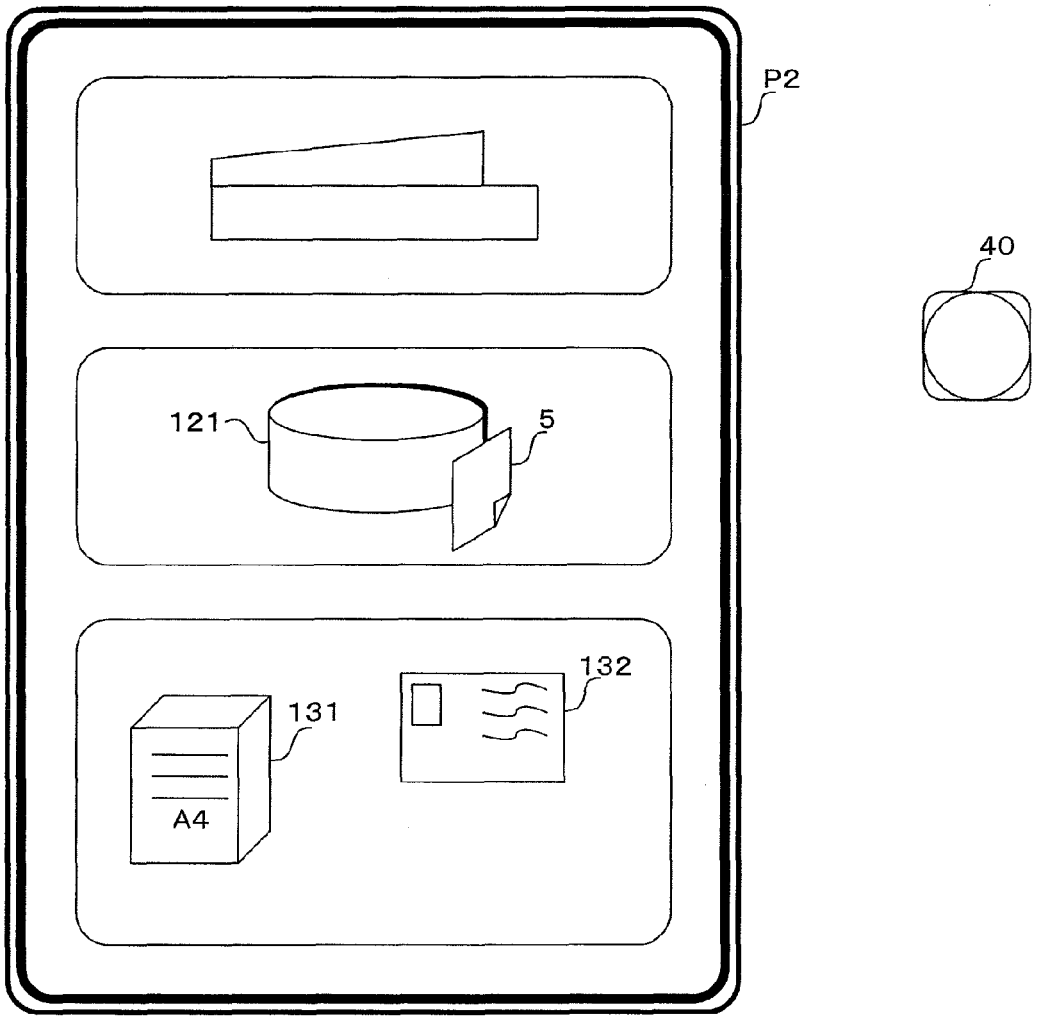


FIG. 3



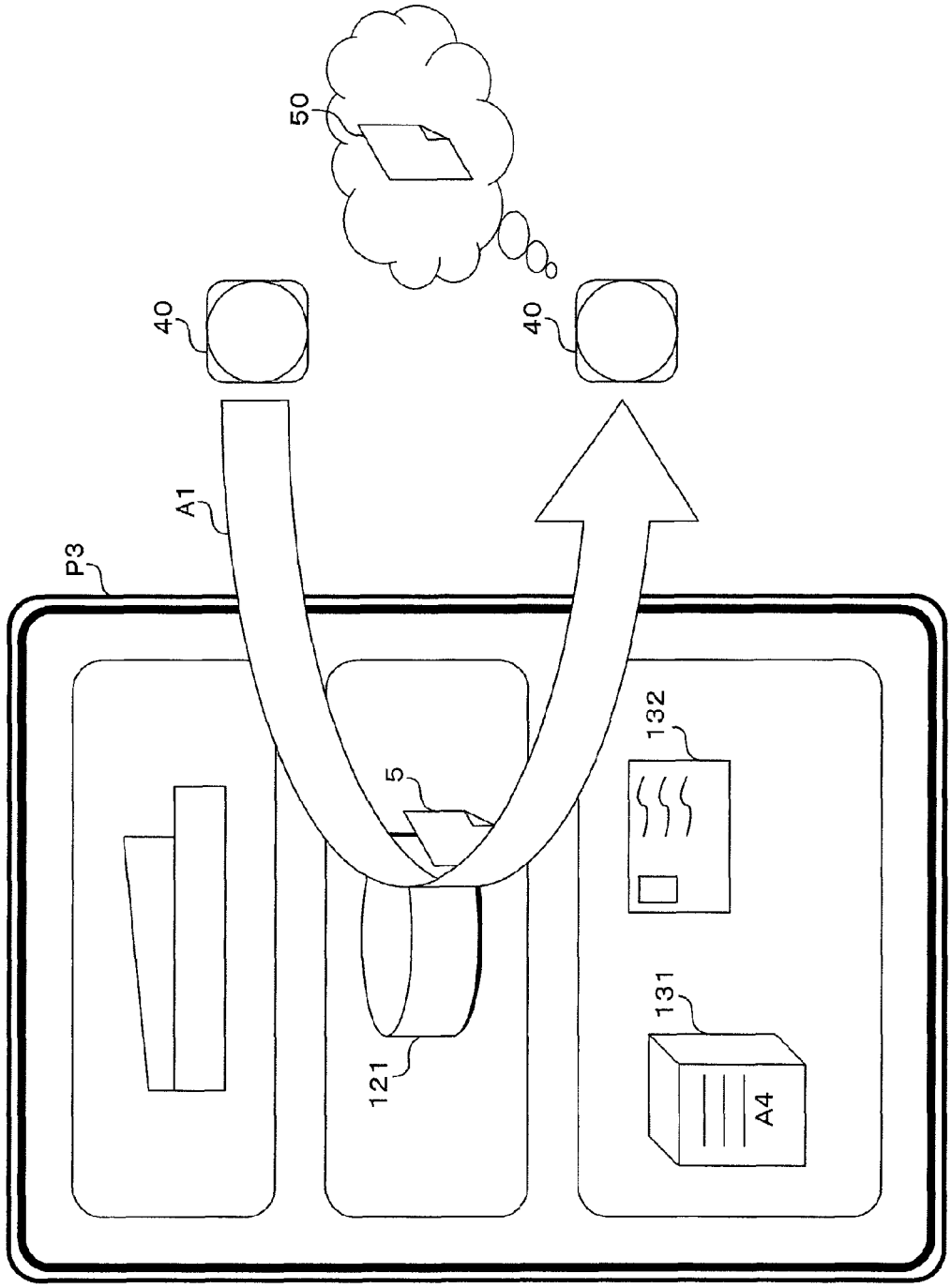
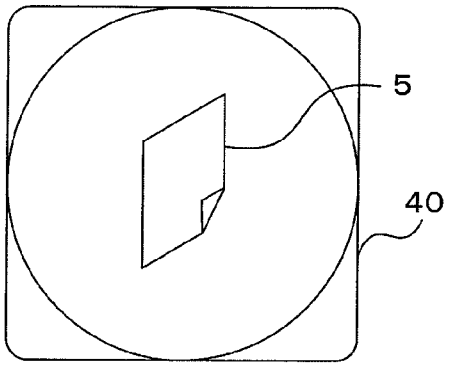


FIG. 4

FIG. 5



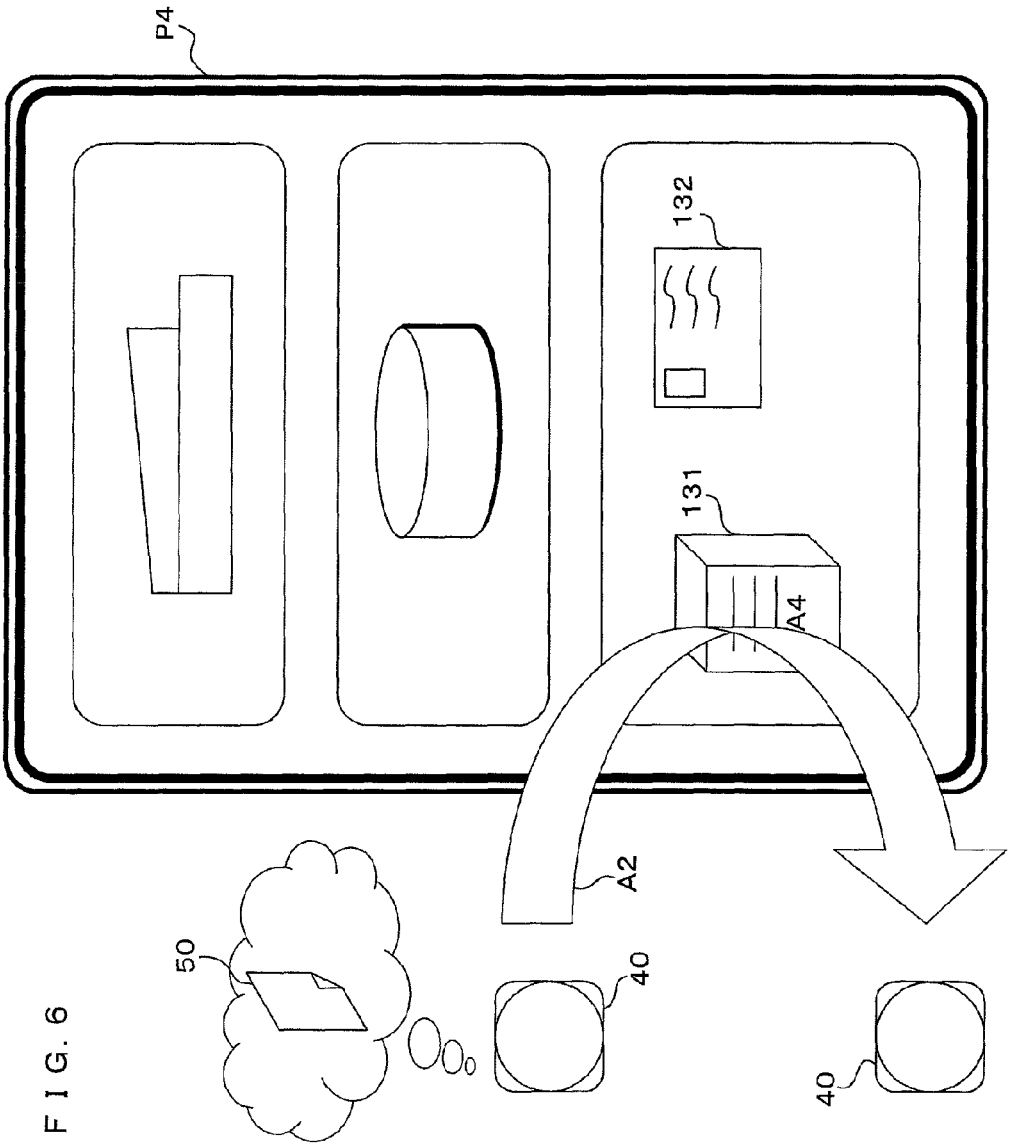


FIG. 6

F I G. 7

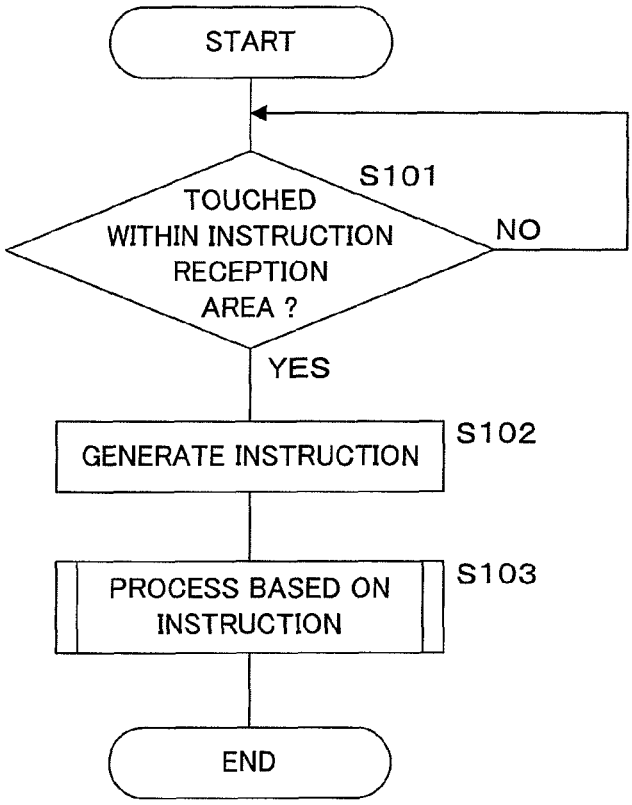

START
S101
TOUCHED WITHIN INSTRUCTION RECEPTION AREA ?
NO
YES
GENERATE INSTRUCTION
S102
PROCESS BASED ON INSTRUCTION
S103
END

FIG. 8

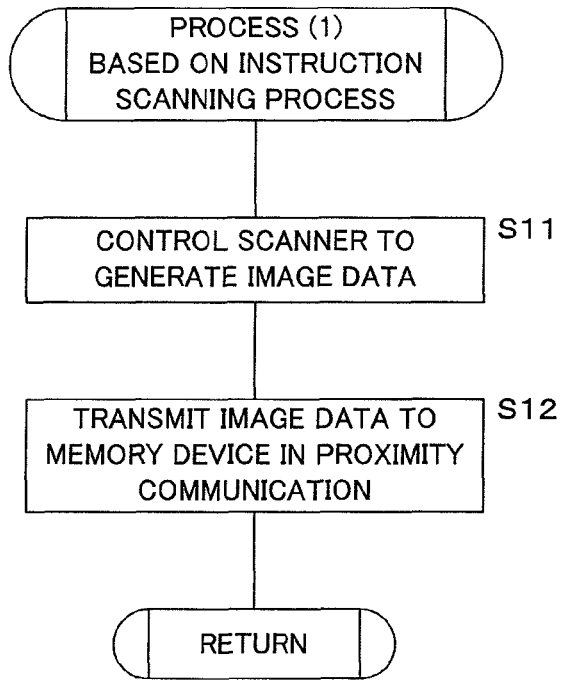

PROCESS (1)
BASED ON INSTRUCTION
SCANNING PROCESS
CONTROL SCANNER TO
GENERATE IMAGE DATA
S11
TRANSMIT IMAGE DATA TO
MEMORY DEVICE IN PROXIMITY
COMMUNICATION
S12
RETURN

FIG. 9

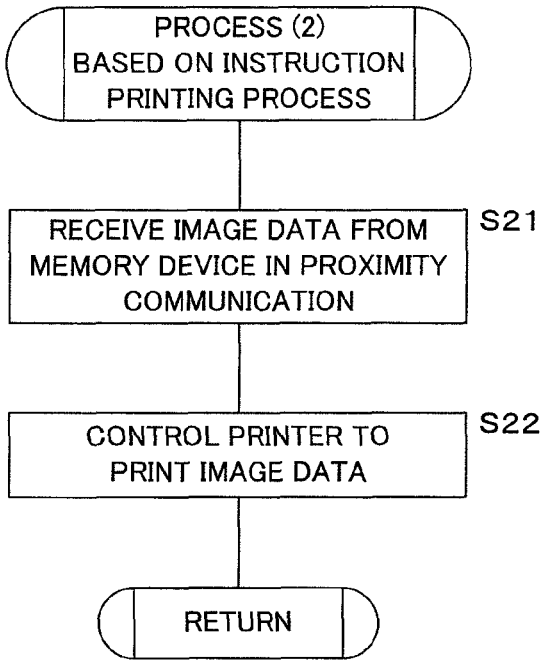
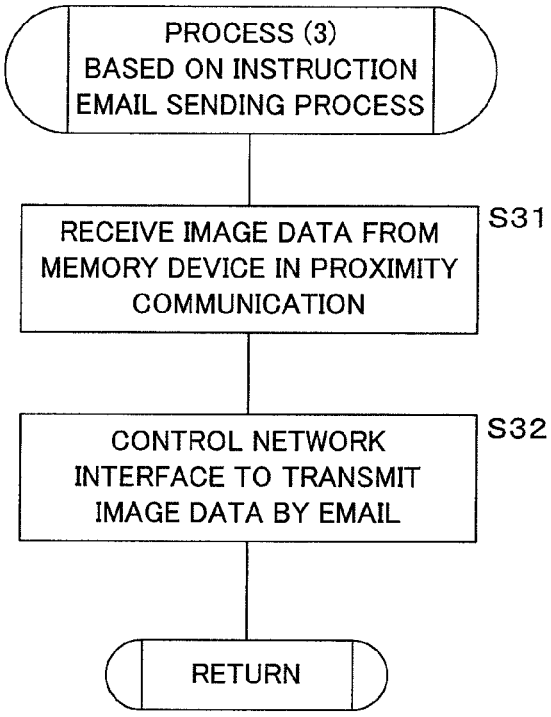

PROCESS (2) BASED ON INSTRUCTION PRINTING PROCESS
RECEIVE IMAGE DATA FROM MEMORY DEVICE IN PROXIMITY COMMUNICATION
S21
CONTROL PRINTER TO PRINT IMAGE DATA
S22
RETURN

FIG. 10


PROCESS (3)
BASED ON INSTRUCTION
EMAIL SENDING PROCESS
RECEIVE IMAGE DATA FROM MEMORY DEVICE IN PROXIMITY COMMUNICATION
S31
CONTROL NETWORK INTERFACE TO TRANSMIT IMAGE DATA BY EMAIL
S32
RETURN

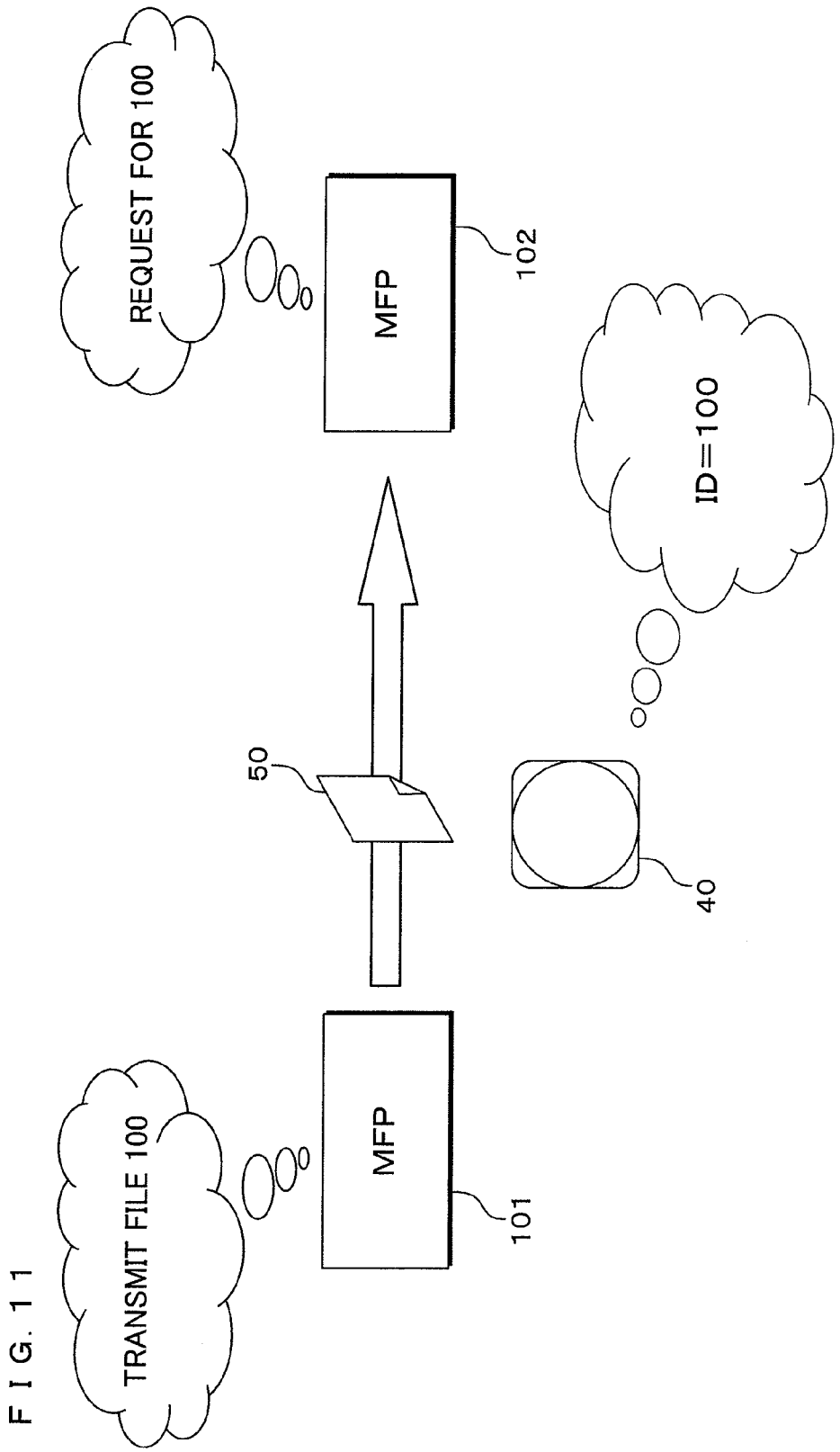


FIG. 11

FIG. 12

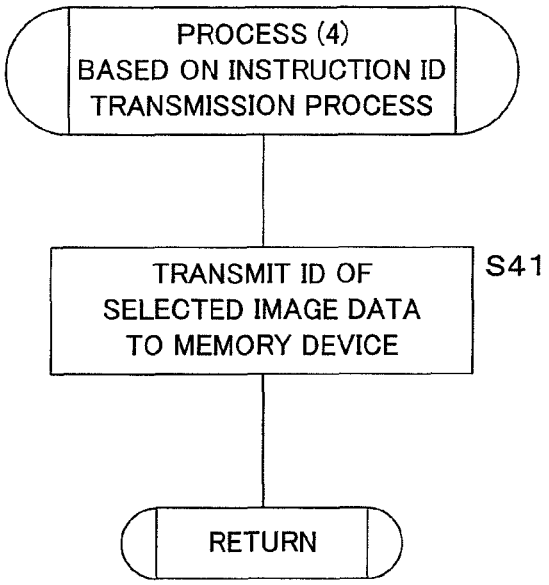

PROCESS (4)
BASED ON INSTRUCTION ID
TRANSMISSION PROCESS
TRANSMIT ID OF
SELECTED IMAGE DATA
TO MEMORY DEVICE
S41
RETURN

FIG. 13

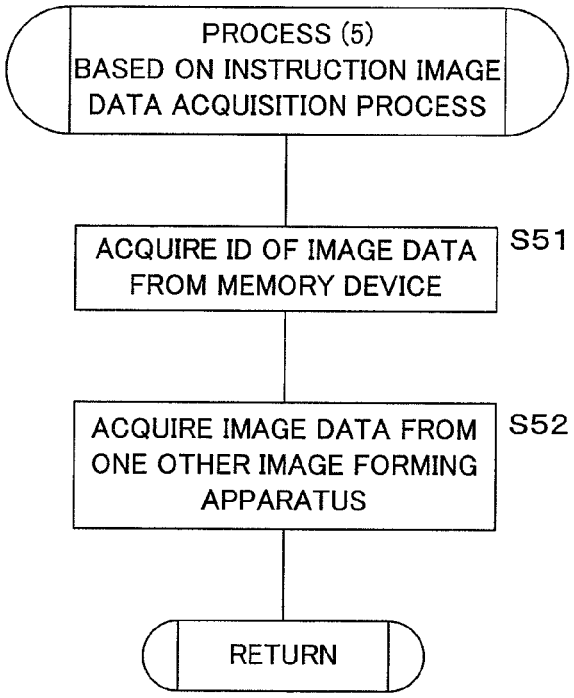
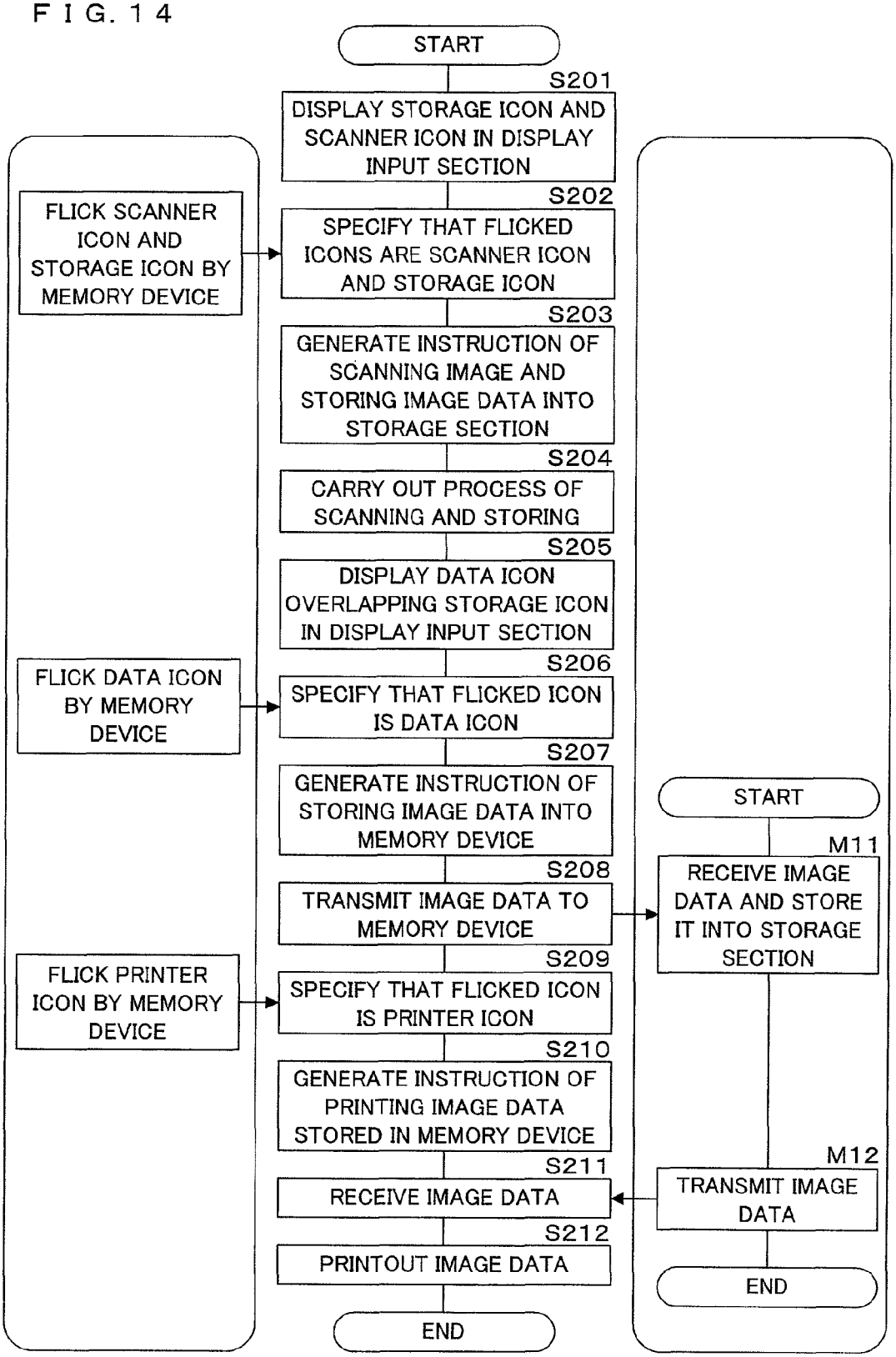

PROCESS (5)
BASED ON INSTRUCTION IMAGE
DATA ACQUISITION PROCESS
ACQUIRE ID OF IMAGE DATA
FROM MEMORY DEVICE
S51
ACQUIRE IMAGE DATA FROM
ONE OTHER IMAGE FORMING
APPARATUS
S52
RETURN

FIG. 14


START
S201
DISPLAY STORAGE ICON AND SCANNER ICON IN DISPLAY INPUT SECTION
S202
FLICK SCANNER ICON AND STORAGE ICON BY MEMORY DEVICE
SPECIFY THAT FLICKED ICONS ARE SCANNER ICON AND STORAGE ICON
S203
GENERATE INSTRUCTION OF SCANNING IMAGE AND STORING IMAGE DATA INTO STORAGE SECTION
S204
CARRY OUT PROCESS OF SCANNING AND STORING
S205
DISPLAY DATA ICON OVERLAPPING STORAGE ICON IN DISPLAY INPUT SECTION
S206
FLICK DATA ICON BY MEMORY DEVICE
SPECIFY THAT FLICKED ICON IS DATA ICON
S207
GENERATE INSTRUCTION OF STORING IMAGE DATA INTO MEMORY DEVICE
S208
TRANSMIT IMAGE DATA TO MEMORY DEVICE
S209
FLICK PRINTER ICON BY MEMORY DEVICE
SPECIFY THAT FLICKED ICON IS PRINTER ICON
S210
GENERATE INSTRUCTION OF PRINTING IMAGE DATA STORED IN MEMORY DEVICE
S211
RECEIVE IMAGE DATA
S212
PRINTOUT IMAGE DATA
END
START
M11
RECEIVE IMAGE DATA AND STORE IT INTO STORAGE SECTION
M12
TRANSMIT IMAGE DATA
END

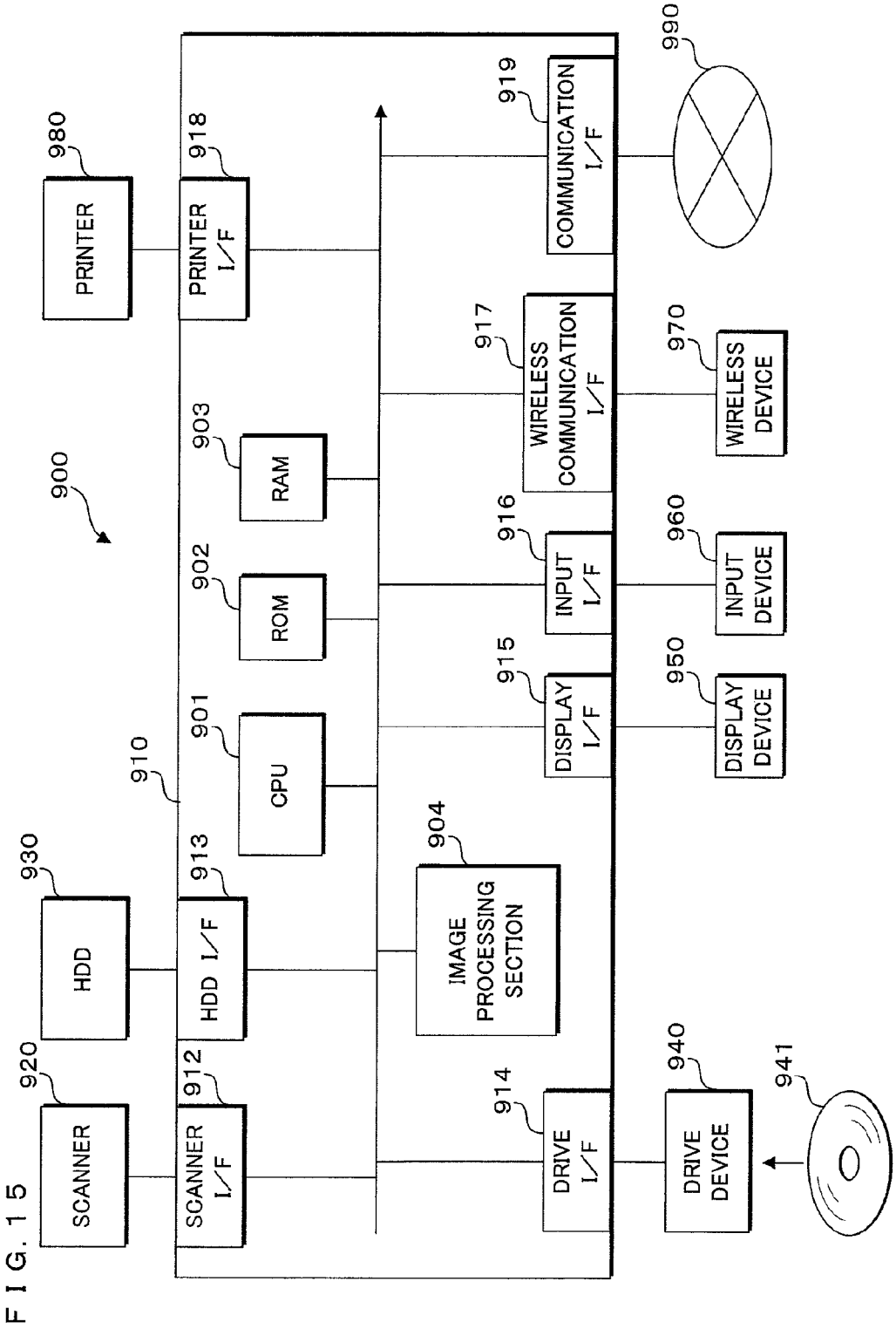

900
910
990
980
PRINTER
918
PRINTER I/F
919
COMMUNICATION I/F
917
WIRELESS COMMUNICATION I/F
970
WIRELESS DEVICE
903
RAM
902
ROM
916
INPUT I/F
960
INPUT DEVICE
901
CPU
915
DISPLAY I/F
950
DISPLAY DEVICE
904
IMAGE PROCESSING SECTION
930
HDD
913
HDD I/F
920
SCANNER
912
SCANNER I/F
914
DRIVE I/F
940
DRIVE DEVICE
941

FIG. 15

IMAGE PROCESSING APPARATUS DETECTING POSITION BETWEEN MOBILE DEVICE AND RECEPTION AREAS AND RECEIVING AN INSTRUCTION OF PROCESSES

CROSS-REFERENCE TO RELATED APPLICATIONS

This non-provisional application claims priority under 35 U.S.C. §119(a) on Patent Application No. 2011-114038 filed in Japan on May 20, 2011. The entire contents of which are hereby incorporated by reference.

BACKGROUND

1. Technical Field

The present invention relates to an image processing apparatus carrying out a process related to image data and an instruction receiving apparatus receiving an instruction of processes.

2. Description of Related Art

Formerly, a multifunction printer, to which a memory device such as a USB memory is connectable, has a scan-to-memory function for reading an image by a scanner and generating image data so as to store the generated image data into a memory device. Additionally, a multifunction printer has a direct printing function for printing out image data stored in a memory device (see, for example, Japanese Patent Application Laid-Open No. 2008-187495).

When a scan-to-memory function is executed, an operator inputs through an input section such as an operation panel an instruction of reading an image by a scanner and generating image data and an instruction of storing the generated image data into a memory device. Additionally, when a direct printing function is executed; similarly, an operator inputs through an operation panel an instruction of selecting image data stored in a memory device and an instruction of printing out the selected image data.

Regarding an operation panel, a touch panel, which receives an input of instruction by carrying out an operation such as touching a display panel by a finger, becomes predominate. Therefore, an instruction of a scan-to-memory function through a touch panel is carried out by a drag-and-drop operation; for example, selecting an icon representing image data or an icon representing a scanner and then dragging the selected icon and dropping into a memory device. Additionally, when an operation of drag-and-drop is not carried out, an icon representing a scanner is selected and then an icon representing a memory device as a memory destination of generated image data is selected.

However, regarding to an input of instruction through a drag-and-drop operation, an operation error may be caused by detaching a finger from a touch panel at the middle of operation. Additionally, an input of the instruction, subjected to a selection of icons, is cumbersome since multiple icons have to be selected.

SUMMARY

In view of such circumstances, an object of the present invention is to provide an image processing apparatus and an instruction receiving apparatus which can easily carry out an operator's instruction of the process by detecting a relative position with respect to one other device.

An image processing apparatus according to the present invention is an image processing apparatus which carries out one or a plurality of processes related to image data transmitted to or received from one other device and has a receiving section having reception areas, each of which is provided for each process for receiving an instruction of the processes; a specifying section detecting a relative position between the other device and the reception areas and specifying one reception area based on the variation of detected relative position; and a processing section carrying out a process, corresponding to the reception area specified by the specifying section, on image data transmitted to or received from the other device.

The receiving section has reception areas, each of which is provided for each process, for receiving an instruction of the processes. The specifying section detects the relative position between the other device and the reception areas and specifies one reception area based on the variation of detected relative position. The processing section carries out a process, corresponding to the reception area specified by the specifying section, on image data transmitted to or received from the other device. Herewith, an instruction of image data processing related to the other device is easily executable.

Regarding to an image processing apparatus according to the present invention, the specifying section detects the relative position based on a radio strength of the proximity communication or a phase of a carrier wave in the proximity communication.

Regarding to an image processing apparatus according to the present invention, the processing section carries out different processes on the image data corresponding to each variation pattern of the relative position between the other device and the reception areas.

An image processing apparatus according to the present invention is an image processing apparatus which has a storage section storing one or a plurality of image data; a receiving section having reception areas each of which is provided for each image data stored in the storage section; a specifying section detecting a relative position between the reception areas and one other device and specifying one image data based on the variation of detected relative position; and a proximity communication section transmitting identification information of the image data specified by the specifying section to the other device through proximity communication.

The receiving section has reception areas each of which is provided for each image data stored in the storage section. The specifying section detects the relative position between the reception areas and the one other device and specifies one image data based on the variation of detected relative position. The proximity communication section transmits identification information of the image data specified by the specifying section to the other device through proximity communication.

An instruction receiving apparatus according to the present invention is an instruction receiving apparatus which has a receiving section having reception areas each of which is provided for each process for receiving an instruction of one or a plurality of processes; a proximity communication section carrying out communication through proximity communication; a specifying section detecting a relative position between a proximity communication device carrying out proximity communication and the reception areas and specifying one reception area based on the variation of detected relative position; and an instruction generating section generating an instruction of executing a process by a processing section corresponding to the reception area specified by the specifying section.

The receiving section has reception areas, each of which is provided for each process, for receiving an instruction of one or a plurality of processes. The proximity communication section performs communication through proximity communication. The specifying section detects a relative position between the proximity communication device carrying out proximity communication and the reception areas and specifies one reception area based on the variation of detected relative position. The instruction generating section generates an instruction of carrying out a process by a processing section corresponding to the reception area specified by the specifying section.

According to the present invention, it provides an image processing apparatus and an instruction receiving apparatus for easily carrying out an operator's instruction of processes by detecting a relative position with respect to one other device.

The above and further objects and features of the invention will more fully be apparent from the following detailed description with accompanying drawings.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

FIG. **1** is a block diagram that shows a functional configuration of an image forming apparatus and a memory device.

FIG. **2** is a view showing an example of a screen to be displayed in a display input section.

FIG. **3** is a schematic view of an example of an instruction inputted from the display input section.

FIG. **4** is a schematic view of an example of an instruction inputted from the display input section.

FIG. **5** is a schematic view of an example of an instruction inputted from the display input section.

FIG. **6** is a schematic view of an example of an instruction inputted from the display input section.

FIG. **7** is a flowchart that shows a procedure carrying out a process based on an instruction inputted from the display input section.

FIG. **8** is a flowchart that shows a procedure of scanning process executed by a control section.

FIG. **9** is a flowchart that shows a procedure of printing process executed by the control section.

FIG. **10** is a flowchart that shows a procedure of mail sending process executed by the control section.

FIG. **11** is a view showing an example of carrying out a transfer of image data through a memory device among plural MFPs.

FIG. **12** is a flowchart that shows a procedure of ID sending process of image data.

FIG. **13** is a flowchart that shows a procedure of image data acquiring process.

FIG. **14** is a flowchart that shows an example of a use case related to an image forming apparatus.

FIG. **15** is a block diagram that shows an example of hardware configuration of an image forming apparatus.

DETAILED DESCRIPTION

An embodiment of the present invention is described in more detail hereinafter with reference to the accompanying drawings. FIG. **1** is a block diagram that shows an example of the functional configuration of an image forming apparatus and a memory device. As referring to FIG. **1**, a communication including image data is carried out in an image forming apparatus **1** based on a memory device **40**, which is adjacent to the image forming apparatus **1**.

The memory device **40** stores data to be inputted or outputted in proximity communication. The memory device **40** has a communication section **42**, a storage section **46**, a vibration motor **44**, a power supply section **45**, and a display section **47**.

The communication section **42** carries out proximity communication. The communication section **42** carries out communication with one other terminal of proximity communication, which is placed in a short distance with respect to the memory device **40**. The proximity communication, which is carried out by the communication section **42**, utilizes Bluetooth™, Contactless IC, or Transfer Jet™. The storage section **46**, which is configured by flash memory as an example, stores data inputted from the communication section **42**. The power supply section **45**, which is configured by a battery as an example, supplies power to each section in the memory device **40**. The display section **47**, which is configured by a LCD as an example, displays information, such as various status of the memory device **40**, to be noticed to an operator. The vibration motor **44** generates a vibration in each status, specified by the memory device **40**, including a successful communication by the communication section **42**. Accordingly, a storage of data into the memory device **40** can be notified to an operator without displaying it in the display section **47**.

The image forming apparatus **1** has a display input section **10**, an instruction generating section **21**, a device section **60**, a storage section **66**, a display input control section **80** and a control section **90**.

The device section **60** has a communication section **62**, a scanner section **63**, a printer section **65** and a network interface section **67**. The communication section **62** carries out proximity communication. The communication section **62** carries out proximity communication with the memory device **40** when the memory device **40** is adjacent to the image forming apparatus **1**. The signals, which are transmitted from the communication section **62**, are data including image data. Also, the signals, which are transmitted from the communication section **62**, may include control command with respect to the image forming apparatus **1** and control command with respect to the memory device **40**.

The scanner section **63** optically retrieves an image on a document and generates image data. The printer section **65** forms and outputs image data on a medium. The storage section **66**, which is configured in a hard disk device as an example, stores a large amount of data including image data. The network interface **67** carries out communication with other devices, which are connected via network (not shown).

An instruction with respect to the image forming apparatus **1** is inputted to the display input section **10**. The display input section **10**, for example, has a touch panel and a LCD, and displays on the LCD an icon for inputting an instruction. The display input section **10** may display an instruction or a condition, which is already set with respect to the image forming apparatus **1**. Also, the display input section **10** may display information of status of the process carried out by the image forming apparatus **1**.

FIG. **2** is a view that shows an example of a screen to be displayed in the display input section **10**. The screen P1 of FIG. **2** includes a scanner icon **111**, a storage icon **121**, a printer icon **131**, and a mail icon **132**. The functions executed by devices, which are configured in the image forming apparatus **1**, correspond to the icons.

The scanner icon **111** corresponds to the scanner function carried out by the scanner section **63**. The storage icon **121** corresponds to the storage function of data by the storage section **66**. The printer icon **131** corresponds to the printing

function executed by the printer section **65**. The mail icon **132** corresponds to the email function via the network interface **67**. The display input control section **80** controls the display input section **10**.

The display input control section **80** has a display control section **81** and a specifying section **82**. The display control section **81** carries out generation of a screen including an icon to be displayed in the display input section **10** and controls the display of the generated screen.

The specifying section **82** specifies, within areas included in a screen to be displayed in the display input section **10**, areas and icons based on the operation by an operator with respect to the memory device **40**. More specifically, the specifying section **82** specifies an area or an icon based on the variation of the relative position between the memory device **40** and the display input section **10**.

For example, the variation of the relative position is detected by flicking or single clicking each area or icon included in the screen P**1**, with respect to the memory device **40**. Additionally, regarding the variation of the relative position, a distance and a direction between the memory device **40** and each area or icon included in the screen P**1**, may be detected and obtained by carrying out proximity communication between the communication section **62** and the memory device **40**. More specifically, the relative position is detected based on a radio strength of proximity communication or a phase of a carrier wave in proximity communication.

Additionally, when a touch is detected through a touch panel, the variation of the relative position with respect to the memory device **40** may be detected in proximity communication.

The instruction generating section **21** generates an instruction of processes controlled by the control section **90**. The instruction generating section **21** generates an instruction of processes corresponding to the instruction receiving areas or icons specified by the specifying section **82**. The instruction, generated by the instruction generating section **21**, intends to process image data or data associated with the icons specified by the specifying section **82**; alternatively, image data or data communicated with the memory device **40**.

Additionally, the instruction generating section **21** generates different instructions for respective different variation patterns of the relative position between the memory device **40** and the display input section **10**. For example, regarding the variation of the relative position with respect to the storage icon **121**, when a flicking operation is carried out by the memory device **40** and when a dragging operation is carried out by the memory device **40**, the instructions differ. More specifically, after image data is transferred to the memory device **40**, in a case of flicking, storing image data stored in the storage section **66** is continued; and in a case of dragging, image data stored in the storage section **66** is deleted.

The control section **90** has a transmission control section **91**, a reception control section **92**, a reading control section **93**, a memory control section **94**, a print control section **95**, a storage control section **96**, and a communication control section **97**.

Both the transmission control section **91** and the reception control section **92** control the communication section **62** to carry out proximity communication. The transmission control section **91** controls transmission of image data and control signal. The reception control section **92** controls reception of image data and control signal. The reading control section **93** controls the scanner section **63** to read an image on a document and generate image data. The memory control section **94** generates a control command to be transmitted to the memory device **40**. The print control section **95** controls the printer section **65** to form image data on a medium. The storage control section **96** controls the storage of data to the storage section **66** and the reading of data from the storage section **66**. The communication control section **97** controls communication through the network interface **67**.

FIG. **3** to FIG. **6** are schematic views that illustrate examples of an operator's instruction inputted from the display input section **10** based on the variation of the relative position between the memory device **40** and the display input section **10**. In a screen P**2** of FIG. **3**, a data icon **5** of a data file is overlapped and displayed on the storage icon **121**. The data icon **5** can identify one image data, which is being stored in the storage section **66**. Additionally, as a plurality of image data are being stored in the storage section **66**, each data icon corresponding to each image data is displayed. Additionally, the memory device **40** is illustrated in FIG. **3**. The memory device **40**, for example, is as large as a palm.

FIG. **4** is a diagram that shows copying image data, which is identified by the data icon **5**, and storing the image data into the memory device **40**. In FIG. **4**, the memory device **40** moves along an arrow A**1**. Due to this moving action, the memory device **40** comes close to the proximity of the storage icon **121**, which is included in a screen P**3**.

More specifically, the memory device **40** comes close to the data icon **5**, which is overlapped and displayed on the storage icon **121**. Accordingly, the specifying section **82** specifies the data icon **5**, and a signal indicating that data icon **5** is specified is transmitted to the instruction generating section **21**. The instruction generating section **21** generates an instruction that transmits, in proximity communication, the image data **50** corresponding to the data icon **5** stored in the storage section **66**, based on this signal.

According to this instruction generated by the instruction generating section **21**, the storage control section **96** retrieves the image data **50** from the storage section **66**; and the transmission control section **91** controls the communication section **62** to transmit the image data **50** in proximity communication. In the memory device **40**, the communication section **42** receives the image data **50**, and the storage section **46** stores the image data **50**.

Additionally, proximity communication can be carried out when a terminal of proximity communication as a communication destination exists within the range of proximity communication being executable. Though the instruction generating section **21** generates an instruction with proximity communication, a message without a terminal of proximity or a message with a request to bring near to a terminal of proximity communication may be displayed, when one other terminal of proximity communication does not exist within the range of proximity communication being executable.

FIG. **5** is a diagram showing an example that the data icon **5** is displayed in the display section **47** of the memory device **40**. The display of the data icon **5** can notify an operator that the corresponding image data **50** is stored in the storage section **46**.

FIG. **6** is a diagram that shows an example of generating an instruction to print the image data **50** according to the movement of the position of the memory device **40** made by an operator. In FIG. **6**, the image data **50** is being stored in the storage section **46** of the memory device **40**. The memory device **40** moves along an arrow A**2** and approaches to the printer icon **131**, which is included in a screen P**4**. Accordingly, the specifying section **82** transfers a signal indicating that the printer icon **131** is specified, to the instruction generating section **21**.

Based on this signal, the instruction generating section **21** generates an instruction of receiving the image data **50** via the

communication section **62** and printing it out by the printer section **65** based on the signal specified by the printer icon **131**. According to the instruction generated by the instruction generating section **121**, the reception control section **92** requests for the image data **50** with respect to the memory device **40**. Accordingly, the communication section **42** of the memory device **40** transmits the image data **50** to the image forming apparatus **1**. The reception control section **92** receives the image data **50** transmitted from the memory device **40**, and the print control section **95** controls the printer section **65** to print out the image data **50**.

FIG. **7** is a flowchart that shows a procedure carrying out a process based on an instruction inputted from the display input section **10**. The input instruction carried out in FIG. **7** is illustrated in FIG. **3** to FIG. **6** as examples. The process of FIG. **7** is executed by the display input control section **80**, the instruction generating section **21**, and the control section **90**. The process of FIG. **7** is initiated from the status that the screen P**1** is displayed in the display input section **10**.

First, the specifying section **82** judges whether or not a touch is carried out on any of instruction reception areas on the screen P**1** (Step S**101**). When a touch is carried out (Step S**101**: YES), the specifying section **82** specifies an icon designated by an operation of the memory device **40** based on the variation of the relative position between the memory device **40** and the instruction reception area and the instruction generating section **21** generates an instruction (Step S**102**). When a touch is not carried out (Step S**101**: NO), Step S**101** is repeated. The control section **90** carries out a process based on the instruction generated by the instruction generating section **21** (Step S**103**).

FIG. **8** to FIG. **10** are flowcharts that show procedures of processes carried out by the control section **90**. The processes shown in FIG. **8** to FIG. **10** are carried out in Step S**103** of FIG. **7**. FIG. **8** is a flowchart that shows a procedure of a process (a scanning process) of generating image data by the scanner section **63**. First, the reading control section **93** controls the scanner section **63** to generate image data (Step S**11**). The transmission control section **91** transmits image data generated by the reading control section **93** to the memory device **40** in proximity communication (Step S**12**).

FIG. **9** is a flowchart that shows a procedure of a process (a scanning process) to print out image data by the printer section **65**. First, the reception control section **92** controls the communication section **62** to receive image data from the memory device **40** in proximity communication (Step S**21**). The print control section **95** controls the printer section **65** to print out image data (Step S**22**).

Additionally, when a plurality of image data are stored in the memory device **40**; first, the reception control section **92** receives identification information of image data in proximity communication, and the display control section **81** displays in the display input section **10** an icon or a filename corresponding to each image data. An operator specifies image data as an intended process through the specifying section **82** based on an operation of flicking one icon from the displayed icons.

FIG. **10** is a flowchart that shows a procedure of a process (email sending process) of transmitting image data by an email through the network interface **67**. First, the reception control section **92** controls the communication section **62** to receive image data from the memory device **40** in proximity communication (Step S**31**). The transmission control section **97** controls the network interface **67** to transmit image data with attached to an email (Step S**32**).

FIG. **11** is a diagram that shows an example of carrying out a transfer of image data through the memory device **40** among a plurality of MFPs. A MFP **101** and a MFP **102** have the same function and configuration as in the image forming apparatus **1**. The process related to the MFP **101** is explained initially in FIG. **11**. A screen, which is the same as the screen P**2** of FIG. **3**, is displayed in the display input section **10** included in the MFP **101**. Identification Information of image data corresponding to the data icon **5** is transmitted to the memory device **40** in proximity communication carried out by the communication section **62** based on an operation of touching the memory device **40** to the data icon **5** in the screen P**2**. In the memory device **40**, identification information is received in the communication section **42** and stored in the storage section **46**. In the diagram, identification information is referenced as ID, and the ID of the image data corresponding to the data icon **5** is 100.

Next, the process related to the MFP **102** is explained. The specifying section **82** specifies an icon and the instruction generating section **21** generates an instruction to carry out a process based on the operation of touching the memory device **40** to the display input section **10** included in the MFP **102**. Based on this instruction, the reception control section **92** included in the MFP **102** controls the communication section **62** to request for information stored in the memory device **40**. Based on this request, the communication section **42** of the memory device **40** transmits ID, and the reception control section **92** receives the transmitted ID.

Based on the received ID, the communication control section **97** controls the network interface **67** to acquire image data from the MFP**101**. With respect to the acquired image data, the device section **60**, by control of the control section **90**, carries out a process corresponding to an instruction generated by the instruction generating section **21**.

FIG. **12** and FIG. **13** are flowcharts that show procedures of processes related to the ID of image data in the process carried out by both the MFP **101** and MFP **102** in the example of FIG. **11**. The processes of FIG. **12** and FIG. **13** are carried out in Step S**103** of FIG. **7**.

FIG. **12** is a flowchart that shows a procedure of a process related to the MFP **101** (an TD transmission process). The storage control section **96** included in the MFP **101** generates identification information of image data corresponding to the touched icon, and the transmission control section **91** controls the communication section **62** to transmit the generated identification information to the memory device **40** in proximity communication (Step S**41**).

FIG. **13** is a flowchart that shows a procedure of a process related to the MFP **102** (an image data acquisition process). The reception control section **92** included in the MFP **102** receives identification information of image data from the memory device **40** in proximity communication (Step S**51**). Next, the transmission control section **97** controls the network interface **67** to receive image data corresponding to identification information (Step S**52**). Additionally, in case when an instruction generated in Step S**102** includes carrying out another process such as printout or email sending after acquiring image data, the corresponding process is carried out by the print control section **95** or the transmission control section **97**.

In FIG. **11** to FIG. **13**, the example of the ID of image data transmitted or received between a MFP and a memory device is described; however, in addition to the ID of image data, the ID of the MFP may also be transmitted or received. More specifically, the ID of the MFP **101** as well as the ID of image data may be transmitted to the memory device **40** from the MFP **101** in FIG. **11**. The MFP **102** receives the ID of image data and the ID of the MFP **101** from the memory device **40**. Accordingly, it becomes easier that the MFP **102** specifies MFP holding image data.

FIG. **14** is a flowchart that shows an example of a use case related to the image forming apparatus **1**. A process of FIG. **14** is carried out by the image forming apparatus **1**. Initially, the display control section **81** controls the display input section **10** to display a scanner icon and a storage icon (Step S**201**). For example, the screen P**1** of FIG. **2** is displayed in the display input section **10**.

Next, an operator flicks the scanner icon **111** and the storage icon **121** of the screen P**1** by the memory device **40**. This action is carried out for inputting an instruction of scanning an image of a document set in the scanner section **63**, generating image data and storing the generated image data into the storage section **66**.

The specifying section **82** specifies that the flicked icons are the scanner icon **111** and the storage icon **121** (Step S**202**). The instruction generating section **21** generates an instruction of scanning an image of a document set in the scanner section **63**, generating image data and storing it into the storage section **66** (Step S**203**). Based on the generated instruction, the reading control section **93** controls the scanner section **63** to generate image data, and the storage control section **96** causes the storage section **66** to store the generated image data into the storage section **66** (Step S**204**).

The display control section **81** displays a data icon corresponding to image data stored in the storage section **66** in a screen displayed by the display input section **10** (Step S**205**). For example, as referring to the screen P**2**, the data icon **5** is displayed so as to overlap the storage icon **121** of the screen P**1**.

An operator utilizes the memory device **40** and flicks the data icon **5** included in a screen displayed by the display input section **10**. The specifying section **82** specifies that the flicked icon is the data icon **5** (Step S**206**). The instruction generating section **21** generates an instruction of retrieving image data corresponding to the data icon **5** from the storage section **66** and transmitting it to the memory device **40** (Step S**207**).

According to the generated instruction, the storage control section **96** retrieves image data stored in the storage section **66**, and the transmission control section **91** controls the communication section **62** to transmit the retrieved image data to the memory device **40** (Step S**208**). In the memory device **40**, the communication section **42** receives the image data, and image data is stored into the storage section **46** (Step M**11**).

An operator utilizes the memory device **40** and flicks the printer icon **131**. Here, the printer icon **131** being displayed in the screen P**2** is flicked. The specifying section **82** specifies that the flicked icon is the printer icon **131** (Step S**209**).

The instruction generating section **21** generates an instruction of receiving image data stored in the memory device **40** and printing it (Step S**210**). The reception control section **92** requests for image data with respect to the memory device **40**, and then the communication section **42** of the memory device **40** transmits image data (Step M**12**). The reception control section **92** controls the communication section **62** to receive image data from the memory device **40** (Step S**211**). The print control section **95** controls the printer section **65** to print out the received image data (Step S**212**).

FIG. **15** is a diagram that shows an example of the hardware configuration of an image forming apparatus of which the functional configuration is shown in FIG. **1**. An image forming apparatus **900** of FIG. **15** has a control section **910**, a scanner **920**, a hard disk device (referred to as a "HDD" below) **930**, a drive device **940**, a display device **950**, an input device **960**, a wireless device **970** and a printer **980**. The control section **910** controls each section connected to the control section **910** and processes image data outputted from the image forming apparatus **900**. Additionally, the control section **910** may be configured as a personal computer.

The control section **910** has a CPU **901**, a ROM **902**, a RAM **903**, an image processing section **904**, a scanner interface (referred to as a "scanner I/F" below) **912**, an HDD interface (referred to as an "HDD I/F" below) **913**, a drive interface (referred to as a "drive I/F" below) **914**, a display interface (referred to as a "display I/F" below) **915**, an input interface (referred to as an "input I/F" below) **916**, a wireless communication interface (referred to as a "wireless communication I/F" below) **917**, a printer interface (referred to as a "printer I/F" below) **918**, and a communication interface (referred to as a "communication I/F" below) **919**.

The CPU **901** carries out control of each section of the control section **910** and each section connected to the control section **910** by executing a computer program. The ROM **902**, for example, stores a computer program executed by the CPU **901**. The RAM **903** stores image data to be processed by an existing function with respect to a computer program carried out by an image processing section **904** and the CPU **901**. Additionally, image data may be stored in the ROM **902**.

The image processing section **904** carries out various controls with respect to image data. The image processing section **904** carries out any one of processes, such as segmentation process, page background removal process, color correction process, black generation and under color removal process, spatial filter process, output gradation correction process, and half tone generation process. A program executed by the CPU **901** may perform the processes carried out by the image processing section **904**. In this case, the image processing section **904** may not be provided in the control section **901**.

The scanner I/F **912** accepts image data inputted from the scanner **920** and carries out an image process according to the property of the scanner **920**. The HDD I/F **913** carries out input and output of image data stored in the HDD **930** based on the control of the CPU **901**. The drive I/F **914** carries out the input and output of data with respect to a removable recording medium **941** inserted to the drive device **940**.

The display I/F **915** outputs image data, which is displayed by the display device **950**. The image data displayed by the display device **950** is generated or edited by, for example, a program executed by the CPU **901**. The input I/F **916** accepts signals inputted from the input device **960**. The signal, inputted from the input I/F **916**, is used when the CPU **901** executes a computer program.

The wireless communication I/F **917** is an interface as wirelessly communicating image data or control signal with one other apparatus through the wireless device **970**. The printer I/F **918** is an interface as outputting image data, processed by the control section **910**, to the printer **980**. The communication I/F **919** is an interface as communicating image data or control signal with one other apparatus through the network **990**.

The scanner **920** reads optically a document on which an image is formed and outputs image data. The image data outputted from the scanner **920** may be an analog signal or a digital signal converted from an analog signal. The HDD **930** stores image data to be processed by the control section **910**. The HDD **930** stores, for example, image data inputted from the scanner **920**, image data inputted from the communication I/F **919**, and intermediate image data generated by a process of the CPU **901** and the image processing section **904**. The drive device **940**, by connecting to a removable recording medium **941**, carries out reading and writing of data with respect to the removable recording medium **941**. For example, the computer program, executed by the CPU **901**, is stored in the removable recording medium **941**.

The display device **950** displays the information related to the process carried out by the image processing apparatus **900**. The status of a process carried out by the image forming apparatus **900** and the configured information with respect to a process carried out by the image forming apparatus **900** are displayed. For example, the display device **950** is a LCD. The input device **960** inputs an instruction from an operator with respect to the control section **910**. The input device **960** accepts an instruction inputted by an operator, and transmits the signal corresponding to the instruction to the control section **910**. For example, the input device **960** is a touch panel. Additionally, the display device **950** and the input device **960** correspond to the display reception section **10** related to an embodiment of the present invention.

The wireless device **970** carries out communication with one other wireless device in wireless communication. For example, wireless communication carried out by the wireless device **970** is proximity communication. The printer **980** outputs and forms image data, processed by the control section **910**, on a medium.

As this invention may be embodied in several forms without departing from the spirit of essential characteristics thereof, the present embodiment is therefore illustrative and not restrictive, since the scope of the invention is defined by the appended claims rather than by the description preceding them, and all changes that fall within metes and bounds of the claims, or equivalence of such metes and bounds thereof are therefore intended to be embraced by the claims.

What is claimed is:

1. An image processing apparatus carrying out one or a plurality of processes related to image data transmitted to or received from a movable one other device, comprising:

a receiving section having reception areas, each of which is provided for each process for receiving an instruction of the processes;

a specifying section detecting a relative position between said movable other device and the reception areas and specifying one reception area based on the variation of detected relative position; and

a processing section carrying out a process, corresponding to the reception area specified by said specifying section, on image data transmitted to or received from said other device.

2. The image processing apparatus of claim **1**,

wherein said specifying section detects the relative position based on a radio strength of proximity communication or a phase of a carrier wave in the proximity communication.

3. The image processing apparatus of claim **1**,

wherein said processing section carries out different processes on the image data corresponding to each variation pattern of the relative position between said movable one other device and the reception areas.

4. The image processing apparatus of claim **1**, wherein said movable one other device is as large as a human palm.

5. An image processing apparatus, comprising:

a storage section storing one or a plurality of image data;

a receiving section having reception areas each of which is provided for each image data stored in said storage section;

a specifying section detecting a relative position between the reception areas and a movable one other device and specifying one image data based on the variation of detected relative position; and

a proximity communication section transmitting identification information of the image data specified by said specifying section to said movable one other device through proximity communication.

6. The image processing apparatus of claim **5**, wherein said movable one other device is as large a human palm.

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